ALUMINUM MELT CLEANLINESS PERFORMANCE EVALUATION USING PoDFA (POROUS DISK FILTRATION APPARATUS) TECHNOLOGY

Carmen STANICĂ[1], Petru MOLDOVAN[2]

Prezența incluziunilor nemetalice solide în aliajele de aluminiu poate provoca scăderea valorilor proprietăților mecanice ale produselor turnate, creșterea porozității gazoase, o prelucrabilitate prin așchiere slabă, micșorarea fluidității și o calitate slabă a suprafeței.

Tehnicile pentru determinarea incluziunilor pot fi: metalografie cantitativă, analize chimice, teste volumetrice, tehnici nedistructive și altele.

Scopul lucrării este studiul evaluării puterii topiturilor din aliaje de aluminiu 5083 prin tehnica PoDFA.

Datele obținute prin analiză arată că probele din aliaj 5083 sunt pur. Conținutul de incluziuni este cuprins între 0.011 mm²/kg și 0.025 mm²/kg, principalele incluziuni fiind TiB₂, Al₄C₃, Al₂O₃, MgO, spinel și material refractar.

The presence of solid non-metallic inclusions in aluminum alloys can cause reduction in mechanical properties of castings, increased gas porosity, poor machinability, decrease in fluidity and poor surface quality.

Techniques for inclusions assessment can be: quantitative metallography, chemical analysis, volumetric tests, nondestructive techniques and so on.

The focus of this paper is to study the assessment of melt cleanliness in 5083 aluminum alloy using PoDFA technique.

Analysis data reflect the cleanliness of 5083 alloys actually sampled. The inclusions content was between 0.011 mm²/kg and 0.025 mm²/kg, the main inclusions being TiB₂, Al₄C₃, Al₂O₃, MgO, spinel and refractory material.

Keywords: aluminum, cleanliness, PoDFA, inclusions

1. Introduction

Aluminum alloys are characterized by their low specific weight, low melting point, negligible gas solubility with the exception of hydrogen, excellent castability, good machinability, and good corrosion resistance. Premium quality castings are an essential requisite for the critical structural components used in automotive and aeronautics. The production of such castings requires that inclusions and porosity be minimized (or even eliminated) to suppress their

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Aluminum Melt Cleanliness Performance Evaluation Using Podfa

John Grandfield,Dmitry Eskin

Aluminum Melt Cleanliness Performance Evaluation Using Podfa:

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Table of Contents Aluminum Melt Cleanliness Performance Evaluation Using Podfa

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